Evaluation of Aftermarket CNG Conversion Kits in Light-Duty Vehicle Applications

Subcontractor

Institute of Gas Technology

Principal Investigator

Christopher F. Blazek
Institute of Gas Technology
4201 West 36th Street
Chicago, IL 60632
(312) 890-6466

DOE Project Manager

John Garbak
U.S. Department of Energy
CE-332, MS 6A-116/Forrestal
1000 Independence Avenue, SW
Washington, D.C. 20585
(202) 586-1723

NREL Technical Monitor

Chris Colucci
NREL
1617 Cole Boulevard
Golden, CO 80401
(303) 275-4478

Subcontract Number

YW-2-12120-01

Performance Period

12/92–4/94

NREL Subcontract Administrator

Scott Montgomery (303) 275-3193

Objective

To examine the effect of natural gas composition on vehicle emissions using three closed-looped compressed natural gas (CNG) conversion systems.

Approach

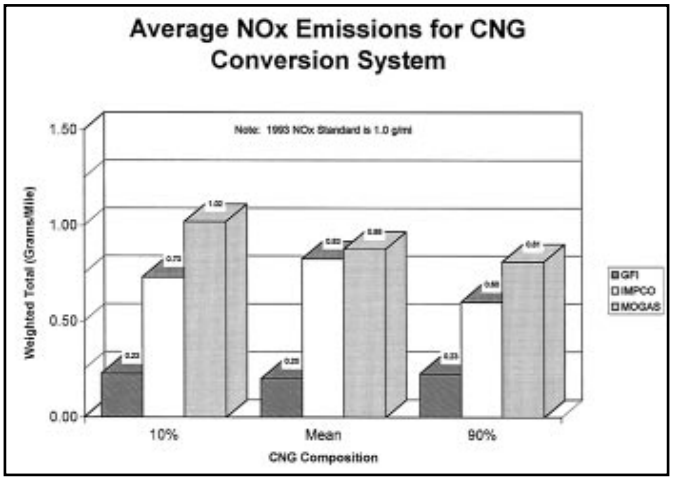
The Institute of Gas Technology evaluated three closed-loop CNG vehicle conversion systems on the same Chevrolet Lumina baseline vehicle. Federal Test Procedure (FTP) emissions and fuel economy were measured for each system using three natural gas compositions, which represent the 10th, mean, and 90th percentile compositions distributed in the continental U.S.

Accomplishments

Each CNG conversion system was installed and adjusted according to the manufacturer's instructions. In addition to FTP testing, the comparative installation times and driveability tests (based on the Coordinating Research Council guidelines) were evaluated for each kit. These compositions demonstrated the system's ability to accommodate the spectrum of gas found in the U.S.

Future Direction

A number of conversion systems (not yet tested on a range of gas compositions) are on the market. Complete speciation analysis should be performed on these systems so we can understand how changes in gas composition affect speciation. New systems that meet more stringent future emission standards need to be developed and tested.



Publications

Blazek, C.F., P. Rowley, and J.W. Grimes. 1994. *Evaluation of Aftermarket CNG Vehicle Conversion Kits in Light-Duty Vehicle Applications.* Draft Report, NREL/TP-425-6550. Golden, CO: National Renewable Energy Laboratory.

Blazek, C.F., P. Rowley, J.W. Grimes, B.K. Bailey, and C. Colucci. 1994. "Natural Gas Vehicle Conversion System Testing," 17th Annual Energy-Sources Technology Conference, January 23–26.

Blazek, C.F.; P.F. Rowley; J.W. Grimes. 1995. "Evaluation of Aftermarket CNG Conversion Kits in Light-Duty Applications". Institute of Gas Technology. Final Report, NREL/TP-425-6550. July.